CHM151 Quiz 4 25 PTS FALL 2006 NAME: Key

SHOW ALL WORK FOR CREDIT

Atomic Masses: Na 22.99, P 30.97, C 12.01, O 16.00, H 1.008, S 32.07, As 74.92

(5) 1. In a titration of 35.00 mL of 0.737 M H_2SO_4, _____ mL of a 0.827 M KOH solution is required for neutralization.

$H_2SO_{4(aq)} + 2KOH_{(aq)} \rightarrow 2H_2O_{(l)} + K_2SO_{4(aq)}$

35.00 mL, 0.737 mol/L | 0.827 mol/L, ? mL

$$35\ \text{mL}\ H_2SO_4 \left| \frac{0.737\ \text{mmol}\ H_2SO_4}{1000\ \text{mL}\ H_2SO_4} \right| \frac{2\ \text{mol KOH}}{1\ \text{mol}\ H_2SO_4} \left| \frac{1000\ \text{mL KOH}}{0.827\ \text{mol KOH}} \right. = 62.38\ \text{mL KOH} \quad (62.4)$$

(5) 2. What is the concentration (M) of sodium ions in 4.57 L of a 0.847 M Na_3P solution?

$$\frac{0.847\ \text{mol}\ Na_3P}{\text{L}} \left| \frac{3\ \text{mol}\ Na^+}{1\ \text{mol}\ Na_3P} \right. = 2.54\ \text{M}\ Na^+$$

(5) 3. Calculate the concentration (M) of arsenic acid (H_3AsO_4) in a solution if 25.00 mL of that solution required 35.21 mL of 0.1894 M KOH for neutralization.

My error

$H_3AsO_{4(aq)} + 3KOH_{(aq)} \rightarrow 3H_2O_{(l)} + K_3AsO_{4(aq)}$

25.00 mL, ? mol/L | 35.21 mL, 0.1894 mol/L

(0.2668 M without using the 3)

$$25.00\times10^{-3}\ \text{L}\ H_3AsO_4 \left| 35.21\ \text{mL KOH} \right| \frac{0.1894\ \text{mmol KOH}}{1000\ \text{mL KOH}} \left| \frac{1\ \text{mol}\ H_3AsO_4}{3\ \text{mol KOH}} \right. = 0.08892 \frac{\text{mol}\ H_3AsO_4}{\text{L}\ H_3AsO_4}$$

(5) 4. What is the concentration (M) of CH_3OH in a solution prepared by dissolving 11.7 g of CH_3OH in sufficient water to give 230 mL of solution?

$$11.7\ \text{g}\ CH_3OH \left| \frac{\text{mol}}{32.042\ \text{g}} \right| \frac{}{230\times10^{-3}\ \text{L}} = 1.588\ (1.59)\ \frac{\text{mol}\ CH_3OH}{\text{L}}$$

5. (4Pts) Complete and balance each of the following:

a. _____$Al(OH)_{3(s)}$ + _3_ $HClO_{3(aq)} \rightarrow 3H_2O(l) + Al(ClO_3)_{3(aq)}$

b. _2_ $H_3PO_{4(aq)}$ + _3_ $Ca(OH)_{2(aq)} \rightarrow 6H_2O(l) + Ca_3(PO_4)_2$